

REMARKS

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

Claims 1-10 were pending in this application. In this response, claims 1 and 8 are amended and no claim is canceled or added. Thus, claims 1-10 remain pending.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims, Figures 2-4 and the specification, pages 7-9, paragraphs 24, 27, and 29.

MATTERS OF FORM

Applicants appreciate the notification from the Examiner that a translation of the foreign priority papers have not been made of record in accordance with 37 C.F.R. § 1.55. Applicants will consider filing a translation if or when the Examiner rejects the claims using a reference found with an effective date between the date of the foreign filing and the date of filing in the United States. At this time, no such reference has been relied on, so there is no reason for Applicants to perfect the foreign priority by providing a translation.

CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claim 1 and 8 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement on the grounds set forth at page 2 of the Official Action. The

Examiner alleges that claims 1 and 8 lack enablement because the invention fails to disclose “with no identifier whose location is accurately known.”

Applicants respectfully traverse the rejection. The Specification at page 7, paragraph 24 reads that “the second work area 18b comprises no identifiers at all, but in that part, the location is determined based only on the dead reckoning technique.” Further the Specification at page 10, paragraph 30 reads that identifiers are devices or targets whose locations are accurately known. Therefore, because the identifiers are at locations that are accurately known and the second work area comprises no identifiers, then it would have been understood that the second work area has no identifier whose location is accurately known. The claimed invention is enabled to contain second work areas provided with no identifier whose location is accurately known by providing the mining vehicles with dead reckoning capabilities for location determination until the mining vehicle re-enters a first work area containing identifiers. For at least these reasons, claims 1 and 8 are supported by the Specification and do not lack enablement. Accordingly, Applicants respectfully request withdrawal of the rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over International Publication No. WO 01/69041 A1 to Hakkinen (hereinafter “*Hakkinen*”) in view of the published article “Mobile robots evolving in industrial applications” to Lehtinen et al. (hereinafter “*Lehtinen*”) on the grounds set forth at page 3 of the Official Action. The Examiner alleges that *Hakkinen* discloses many of the elements of claims 1 and 8. However, the Examiner admits that *Hakkinen* fails to disclose a method for determining the location of the mining vehicle substantially continuously in the first work and the second work area on the basis of a

dead reckoning, wherein the distance traveled is calculated and the travel direction is determined, determining, when operating in the second work area, the location of the mining vehicle only on the basis of the dead reckoning; updating the location data determined in the dead reckoning on the basis of the location data of the identifier when driving in the first work area; and a method comprising the second work area is provided with no identifier whose location is accurately known. *See, e.g.*, p. 4 of the Office Action dated January 2, 2009. The Examiner further alleges that *Lehtinen* cures these deficiencies by using a dead reckoning unit on mining vehicles to determine distance and direction, and identifiers in the form of beacons, transponders or landmarks to update the location determined by the dead reckoning unit.

Applicants respectfully traverse the rejection. The Examiner appears to state that *Lehtinen* discloses a first work area with identifiers and a second work area without identifiers. To make the disclosure of *Lehtinen* include a first work area with identifiers and a second work area without identifiers, the Examiner appears to interpret first and second work areas to be any location with any size. By interpreting the work areas in this way, the Examiner arbitrarily divides up the single work area disclosed in *Lehtinen* into areas precisely at a landmark as first work areas and the area between that landmark and the next one as a second work area.

Although Applicants believe the interpretation of work areas by the Examiner is unreasonable in light of the specification, the second work area has been further defined in the claims to better differentiate from the continuously identifier updated system of *Lehtinen*. Claims 1 and 8 each now recite “wherein the second work area is one selected from the group consisting of a mining area separate from the first work area and a section of a mining area that also contains the first work area, wherein the size of the second work area is sufficient to cause a mining vehicle working that mining area to have discontinuities in location updates obtained by

identifiers with accurately known locations.” In contrast, *Lehtinen* is silent to any separate mining area without identifiers or a single mining area containing second work areas without identifiers that cause discontinuities in location updates obtained by identifiers. *Lehtinen* discloses that the opposition estimation is updated continuously. *See, e.g.*, page 98, left column, last sentence. Further, as explained by the Examiner, the landmarks of *Lehtinen* are spread across the work area at a certain distance (e.g. 20 meters), which is not a size large enough to cause discontinuities in location updates obtained by those landmarks. Further, it would not have been obvious to spread the landmarks further, because then the system could no longer update continuously as required by *Lehtinen*. Thus, *Lehtinen* merely discloses a first work area where the identifiers are spread in a manner that enables continuous updates, and no second work area without identifiers.

The Examiner has also alleged that *Hakkinen* also discloses first and second work areas. In *Hakkinen*, mine galleries, which have not yet been mined, are marked with reference number (1'). When new mine galleries are excavated blasting holes are first drilled in the end of the tunnel by means of drilling rig (4), which is remote controlled by a human. Then the end is blasted, and broken rock is removed by means of a loading vehicle (5), which is also remote controlled by a human. As it is taught in *Hakkinen*, these two production vehicles are not provided with any measuring devices.

The claims recite that the location of the mining vehicle is substantially continuously determined in the first work area and the second work area on the basis of a dead reckoning. In *Hakkinen*, the location of the drilling rig (4) or the loading vehicle (5) is not defined continuously in either the already mined section or the mine sections not yet being mined. Thus, *Hakkinen* fails to disclose the claimed first and second work area.

Further, in the second paragraph on page of the Office Action dated January 2, 2009, the Examiner states that it would have been obvious to replace the inertial measurement device of a measuring vehicle (3) of *Hakkinen* by a dead reckoning device of *Lehtinen* and incorporate it in the production mining vehicles (4, 5) of *Hakkinen* to continuously determine the position, especially when new galleries are mined. However, an inertial measuring device is an exact device the operation of which is based on the gravitational fields of the earth, as disclosed in page 2, lines 19-23 of *Hakkinen*. Dead reckoning devices have the disadvantage that, for example, tire slippage causes inaccuracy. Therefore, Applicants submit that it would not have been obvious to substitute the accurate inertial measuring device with the more inaccurate dead reckoning device.

Further, *Hakkinen* discloses placing the inertial measuring device only on the measuring vehicle and not the production mining vehicles (4, 5). In contrast to the Examiner's conclusion, *Hakkinen* teaches away from adding any type of measuring device to the production mining vehicles, because the goal of *Hakkinen* is to have a measuring device measure and mark the mining areas so that the production mining vehicles can operate without the expense of measuring devices.

Additionally, the combination of *Hakkinen* and *Lehtinen* teach away from a second work area without identifiers as it is defined in the claims. *Lehtinen* teaches to spread landmarks across the route so that continuous updating is possible. The Examiner mentions that landmarks could be placed at 20 meter intervals throughout the mining area in which the vehicles will be working. To place landmarks in a manner that allows for continuous updating requires a great number of identifiers and advance information of the route to be driven. Furthermore, *Hakkinen* teaches that a new mine gallery has to be first measured and marked with markings before other

mine vehicles can operate in the new gallery. Thus, a great deal of advance information is also needed in *Hakkinen*. Whereas the method and system of the claims can work in a second work area where there is little or no advance information, with no identifiers, before coming back to a first work area that is marked and measured as required in *Hakkinen* and *Lehtinen* for all working areas.

For at least the above reasons, *Hakkinen* and *Lehtinen* fail to teach all of the elements of claims 1 and 8. Dependent claims 2-7 and 9-10, which depend from claim 1 or 8, respectively, are also not obvious for at least reasons similar to those for claims 1 and 8. For at least these reasons the rejection should be withdrawn.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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